SNOWMOBILE DRIVE TRACK

Background of the Invention

The present invention is directed to an endless drive track for a snowmobile. Typically, snowmobiles are driven by an endless track provided with traction lugs that engage the snow or ice over which the snowmobile travels. The traction lugs are oriented perpendicular to the base of the track.

Summary of the Invention

The present invention provides an endless drive track in which the traction lugs are inclined relative to the normal to the track base. When the traction lugs are inclined away from the direction of travel of the track, the traction lugs can compress deep snow before gripping with the snow, which can provide the snowmobile with lift when traveling in deep snow. When the traction lugs are inclined in the direction of travel of the drive track, they can provide a more aggressive gripping of the surface on which the snowmobile is traveling, resulting in improved acceleration.

Brief Description of the Drawings

Figure 1 is a side view of a snowmobile.

Figure 2 is a sectional side view of a portion of an endless drive track for a snowmobile of the present invention.

Figure 3 is a side view of a further embodiment of a drive track for a snowmobile of the present invention.

Figures 4A-B are side views illustrating the operation of a snowmobile with a drive track of the present invention and that of the prior art.

Fig. 5 is a plan view of a further embodiment of a drive track for a snowmobile of the present invention.

Fig. 6 is a partly sectional side view taken along line 6-6 in Fig. 5.

Figs. 7 and 8 are perspective views of the drive track for a snowmobile of the embodiment of Fig. 5.

Fig. 9 is a sectional lateral view of the drive track for a snowmobile of the embodiment of Fig. 5.

Detailed Description

Figure 1 shows a side view of a typical snowmobile 10. The drive system for the snowmobile includes an endless track 12, which passes around drive sprockets and idler wheels. The endless drive track 12 is provided with traction lugs that grip the surface over which the snowmobile travels. Thus, as the endless track is driven to rotate around the drive sprockets and idler wheels, the snowmobile moves forward or backward, depending on the direction of relative rotation between the drive track and the drive sprockets and idler wheels.

Referring to Figure 2, the endless drive track of the present invention includes a track base portion 14 and traction lugs 16. The base and traction lugs can be a unitary, molded one-piece construction. The endless drive track can be provided with a reinforcing bar 18, as is customary.

The traction lugs of the endless drive track of the present invention are inclined relative to the normal to the track base portion 14. For purposes of the present invention, the inclination of a traction lug is determined by considering a line drawn from the midpoint of the portion where the traction lug joins the track base portion to the midpoint of the tip portion of the traction lug, when viewed from the side. The term normal is referring to the geometric normal,

i.e. a line extending perpendicularly from the track base when the track base is oriented in a horizontal plane. This is illustrated in Fig. 3.

In one aspect of the present invention, the traction lugs are inclined away from the travel direction of the endless drive track, as seen in Fig. 3. For the purposes of the present application, the direction of travel is considered the direction in which the drive track moves relative to the drive sprocket and idler wheels when a snowmobile is moving forward. Thus, for example, in Figure 1, the direction of travel for the drive track would be in the clockwise direction.

When the traction lugs are inclined away from the direction of travel for the endless track, the traction lugs may have the function of compressing snow on which the snowmobile is traveling before gripping and engaging the snow. That is, the traction lug will compress the snow as well as scoop the snow. This can be advantageous in providing the snowmobile with lift when traveling in deep snow. Referring to Figures 4A and B, the compression action will be described in more detail. As seen conceptually in Figure 4A, as the drive track comes around the drive sprockets 20, the traction lugs will come into contact with the top of the snow. The inclined traction lugs of the present invention allow the snow to be pressed downwardly toward the bottom of the track. That is, the contact surface with the snow is more horizontal, improving the transport of the snow to the bottom of the track. This action tends to pack the snow down, with the track lifting itself, and thus the snowmobile, over the packed snow. The compressed snow also provides improved traction for the traction lugs. These effects are especially significant in deep snow. In contrast, the perpendicularly oriented traction lugs in Figure 4B tend to shear the snow, causing it to crumble and disperse. Thus there is less packing of the snow, and there is more of a tendency for the traction lugs to dig out the snow, causing the snowmobile to tend to sink.

The angle of inclination of the traction lug should be sufficient to provide the compressing action, but not so great as to reduce the traction function significantly. Typically, the angle of inclination of the traction lug will be in the range of 5 to 45 degrees, preferably 5 to 30 degrees, more preferably 5 to 15 degrees. It also is possible to consider the inclination of the

leading face of the traction lug. It is preferred that the upper part of the leading face of the traction lug have an inclination of at least 5 degrees, preferably at least 10 degrees, and more preferably at least 15 degrees relative to the normal to the base portion. The traction lugs generally will have a height of about 0.5 to 3 inches (1 to 8 cm), preferably about 1.5 to 3 inches (3 to 8 cm).

The leading and trailing faces of the traction lugs can be parallel or, as illustrated in Figure 2, they can have different angles of inclination. In the example illustrated in Figure 2, the leading face is inclined at an angle of about 15 degrees while the trailing face is inclined at an angle of about 5 degrees. Also, as illustrated in Figure 2, the inclination of the face need not be constant over its height. For example, the angle of inclination of the face can increase toward the tip of the traction lug. The inclined face of the traction lug may have a point of inflection, that is a point where the angle of inclination changes, above or below a midpoint of the height of the traction lug. There may be two or more different inclination angles on the face of the traction lug.

It is not necessary for the trailing face of the traction lug to be inclined in the same direction as the forward face. The trailing face could be oriented perpendicular to the base portion of the track, or as illustrated in Figure 3, could be inclined at least partly in a direction opposite to the inclination of the leading face. As long as the leading face is inclined sufficiently in the direction opposite to the direction of travel, the desired effect of compressing snow can be achieved.

Referring to Figs. 5-9, it can be seen that the traction lugs can be provided in a staggered relationship on the track. The upper edge of the tip of the traction lug can be provided with indented portions, e.g. scallop-like cutouts. The traction lugs can be formed to extend in a straight line across the track. Alternatively, as seen in Figs. 5, 7 and 8, the traction lugs can be formed into a shape with undulations instead of a straight line.

In another aspect of the present invention, the traction lugs are inclined toward the direction of travel. This can provide a more aggressive grip of the surface on which the snowmobile is traveling. This can provide advantages in acceleration and hill climbing.

It is possible to provide the track with some traction lugs that are inclined away from the direction of travel and some that are inclined toward the direction of travel. In one example, the traction lugs inclined in different directions would be arranged as alternating rows, with each row having traction lugs inclined in the same direction. In another example, traction lugs with different directions of inclination would be included in the same row.

The traction lugs can be provided at intervals across the width of the endless drive track in the usual manner. The traction lugs can be spaced in the longitudinal direction of the drive track in the usual manner. The endless drive track can be made of known elastomeric and composite materials.

A detailed description of the invention has been provided above, but the present invention is not limited thereto. Modifications not departing from the spirit of the invention will be apparent. The invention is defined by the claims that follow.